term culture. Unlike most of the other techniques, these latter two approaches have the merit of giving relatively prompt answers, a *sine qua non* in the clinical management of this class of patient.

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The Role of Parathyroidectomy in Secondary Hyperparathyroidism

INCREASED PARATHYROID ACTIVITY has long been recognized as a common feature of advanced renal disease. As the lives of the patients are being prolonged by improved conservative therapy, by hemodialysis and by transplantation, the complications of overt hyperparathyroidism are being encountered with increasing frequency.

Because of the altered renal function, the usual biochemical determinations that are so important in the diagnosis of primary hyperparathyroidism are of limited value in detecting secondary hyperparathyroidism. One or more of the following manifestations may be present: (1) radiographic and clinical evidence of osteodystrophy, (2) soft tissue calcifications, (3) intractable pruritus, and (4) persistent and symptomatic hypercalcemia.

The majority of patients with these complications will respond to vitamin D along with measures to lower the serum phosphate level. Subtotal parathyroidectomy should be considered only in the occasional patient who continues to show progression of the disease in spite of intensive medical therapy. Removal of three and three-fourths glands will usually be followed by prompt symptomatic improvement, resolution of ectopic calcifications, and healing of skeletal lesions.

The hypercalcemia that may occur following successful renal transplantation is usually transient and rarely justifies parathyroidectomy.

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Zollinger-Ellison Syndrome (ZES)

DISTINGUISHING BETWEEN PATIENTS with severe duodenal ulcer disease and those with the Zollinger-Ellison Syndrome (ZES) is both difficult and vitally important. The classical description of marked gastric hypersecretion, severe duodenal or jejunal ulceration and diarrhea is seldom found until late in the course of the disease. Thus, patients with severe ulcer disease or the ZES may have similar symptoms, gastric secretory results, and roentgenographic findings. Hence, most patients have had previous operation for presumed duodenal ulcer disease before they were found to have a ZES. Tragically, this results in an increased mortality in this disease.

While serum gastrin determinations provide an objective test for the ZES, the procedure is time-consuming and not generally available. Recently it has been discovered that ZES patients produce large quantities of acid in response to infusions of calcium ions. This response is immediate and pronounced in that it equals or exceeds the maximal acid response in these patients. It is accompanied by a progressive rise in serum gastrin levels. Duodenal ulcer patients, in contrast, respond with a delayed and minimal output of acid. Calcium infusions are rapid, simple and safe. A calcium infusion, therefore, may be a useful diagnostic aid in patients with severe duodenal ulcer disease from ZES.

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